

4 Boiler Room Upgrades

That Conserve Energy & Save Money

Save 4-10% By Optimizing Fuel/Air Ratios
with linkageless controls

Save At Least 10-30% On Energy Costs
by controlling motor speed with
Variable Frequency Drives (VFDs)

Avoid Thousands Annually In Steam Energy Loss
by maintaining steam traps

Document The Savings
by metering gas & electric on specific areas

ICD
BUILDING AUTOMATION

Rawson | **Industrial Controls**
an **ERIKS** company

About Rawson/Industrial Controls

Created by joining two industry-leading companies in 2019, Rawson/Industrial Controls offers more than 100 years of combined experience serving customers in the oil and gas, chemical, refining, pharmaceutical, pulp and paper, food and beverage, water and wastewater, and power generation industries. With a team of in-house engineers, along with instrumentation and valve customization services, Rawson/Industrial Controls designs and customizes product solutions to help customers solve complex problems. The company currently has partnerships in 32 states across the Gulf Coast, Mid-Atlantic, Midwest, Northeast, Southeast, and Southwest regions of the U.S.

About ICD Building Automation

ICD Building Automation provides complete solutions—including heating, air conditioning, ventilation, combustion, sensors, flow and valves, as well as complementary equipment. ICD Building Automation partners with the industry's top manufacturers, and is a Honeywell Diamond Distributor, which recognizes the top-performing companies in Honeywell's Authorized System Distributors (ASD) program. ICD Building Automation is also a Belimo Platinum Distributor and is supported by a team of experienced application engineers who specialize in preparing and upgrading facilities for the future, and providing customized solutions, technical support and training. ICD Building Automation has a primary coverage area for customers located in the Northeast, Mid-Atlantic, Midwest and the Southeast parts of the United States. Visit Industrialcontrolsonline.com for more information.

Surveys

Steam Trap Surveys

Maintaining high-quality steam to all steam users can greatly impact plant safety, reliability, productivity, and environmental targets impacting site financial success. Routine steam-trap testing and trap repairs are critical to keep steam systems operating at peak performance. Rawson's Energy Management & Technology (EM&T) division has the technical expertise and tools required to provide accurate steam-trap evaluations and easily understood reports with information to manage the steam-trap population, while prioritizing repairs.

All EM&T members are TLV TrapMan® factory-trained and certified and have 10+ years of steam-trap testing experience in a variety of applications. EM&T has a spotless safety record with zero incidents, accidents, or recordables. All members participate in background checks, TWIC, and random D&A testing programs.

Boiler & Burner Surveys

Boiler and burner maintenance is a critical component of plant safety, efficiency and uptime. Early identification of potential safety-system issues helps prevent costly mishaps and assists with continued approval and certification of the burner system by local authorities and insurance companies.

Rawson/Industrial Controls' team of combustion specialists offers burner/boiler safety audits through which instrumentation, controls, and field components are identified, verified for application, and tested for proper function. Action plans are developed to bring the system into compliance.

Services included in these surveys are:

- Review existing documentation and drawings.
- Contrast state of existing equipment to the original design.
- Perform safety-valve leak checks.
- Provide action plans for updating burner controls.
- Perform dynamic safety test, including step-by-step testing of safety devices and interlocks.
- Report on items that are not in compliance, no longer functional or obsolete.

Rawson/Industrial Controls also offers burner-system migrations, upgrades, and energy-efficiency optimization.

- **Advice on Product Selection** - Our customers rely on us to help them size and select products for their applications. Our experienced sales organization has wide product and application know-how.

- **Design & Co-Engineered Solutions** - Our tailor-made solutions help customers solve their difficult process control problems. We have in-house engineering and design capabilities at multiple locations based in Texas, New Jersey, and Wisconsin.

- **Valve Automation** - We offer the complete package (control valve, actuator, and instruments) that is assembled, tested, and ready for installation.

- Standard and custom valve configurations
- Complete documentation of engineering drawings for assemblies

- **Steam Trap Surveys** - Rawson and Energy Management & Technology (EM&T) provide the most accurate data and the highest quality products needed to improve the steam quality, equipment reliability, and steam system safety at your site.

- **Thermal Processing & Heating Controls**

- Highly accurate temperature, humidity, and airflow control reduces energy costs and product waste, while producing a superior product.
- Automated recipe archival and execution maintains product consistency, simplifies changes, and reduces operator intervention.
- Real-time centralized monitoring and control optimizes process supervision and coordination activities.
- Web-enabled monitoring and automated paging capabilities provide remote access and alarm notifications.
- Automated alarm processing speeds problem recognition and reduces downtime.
- Historical data provides batch histories for customer and regulatory compliance documentation.
- Embedded control philosophies maintain product consistency and improve access safety.

- **Instrument Service** - Improved delivery times, more efficient inventory management, and less inventory shrinkage through:

- Product modifications, such as calibration and liquid filling of gauges
- Bag and tag
- Rental tool program
- Minor sub-assemblies

- **Automation & SCADA Programming** - Our customer gets a complete solution that is designed, assembled, tested, ready for installation, and customizable from a remote location.

- Standard and custom configurations
- Specified solutions with right computer hardware, software, controllers, and all interfaces



Boiler Efficiency Improvement

Using Linkageless Control For 4-10% Fuel Savings

Most boilers have old mechanical linkage systems with one "foot-mounted" actuator to position both air and fuel at the same time. A linkageless fuel/air ratio control system replaces this single actuator with separate direct-coupled actuators for the air, fuel, and flue gas recirculation (FGR), if required.

Linkageless systems are easy to set up and eliminate the mechanical wear that normally occurs on ball joints over time. In general, "hysteresis" or drift increases with the number of joints. O2 level generally has to be set higher to compensate, and this results in inefficiency and increased fuel costs.

Linkageless systems are especially useful for dual fuel applications. Mechanically linked systems typically require readjustment of combustion air when switching fuels, compromising maximum efficiency for either fuel profile. Linkageless systems allow for two independent fuel curves.



A linkageless system provides:

- Closer and more precise firing rate control over the entire firing rate of the burner
- Increase turndown ratio from 3:1 to 6:1
- Improved 4-20 mA controller operation over old 135 ohm slide wire controls
- Can incorporate optional "Low Fire Hold" to prevent short cycling and boiler thermal shock
- Password protected to prevent unauthorized readjustment
- Safe shutdown if a positioning error is found
- Easy setup with a step-by-step menu driven commissioning process

Boiler Efficiency Improvement

Case Study: Medical Research Company

When an old, obsolete flame safeguard failed on one of their three boilers, a medical research company in Monmouth County, New Jersey, contacted Industrial Controls. They had already restarted the "critical" 2,930,000 BTU boiler using spare parts from a scrap pile. However, their 150 PSI medical steam cleaning operation required a permanent, more reliable solution.

Since they had to replace the obsolete flame safeguard, they decided to upgrade to a Linkageless Fuel/Air Ratio Controller system on the one boiler. They had never measured fuel flow, but immediately after installation, their engineer noticed a "considerable" decrease in fuel consumption.

Without an actual fuel consumption measurement on the repaired boiler, the savings were obvious enough that the engineer subsequently upgraded his other two fully functional boilers.



The research company **now saves an estimated 7% on their total fuel consumption.**

The company is located in an area where power outages occur very frequently. He said, "After an outage, I can press the reset button and walk away. I have great confidence in this system so I don't have to stick around to babysit the whole startup process."

The engineer can rest assured knowing that replacement parts are readily available. Their medical steaming operation will continue without interruption.

Engineered Solutions



- Multiproduct specialist with expertise in industrial instrumentation, actuation, and automation

Learn more at:

www.rawsonicd.com/services-support/engineered-solutions

Microprocessor Burner Controls



- Five LEDs provide sequence information
- Five function Run/Test Switch Interchangeable plug-in flame amplifiers

Combustion Efficiency Systems



- Advanced burner management controller with internal flame safeguard
- Designed to operate burners firing liquid or gaseous fuels

Flame Monitor



- Microprocessor based burner management control system
- Non-volatile memory
- A constant flame signal read-out
- RS485 multi-drop link

Hydramotor 2-Position Actuator



- Enclosure Type 1, General Purpose [Standard], Type 3 raintight/Type 4 watertight [optional]
- Standard Voltages: 24, 120, 240 volts, AC, 60 Hz
- Auxiliary Switches: [optional]

Gas Regulators



- Spring loaded gas regulators with internal relief provide consistent and controlled pressure in a variety of residential, industrial and commercial applications.

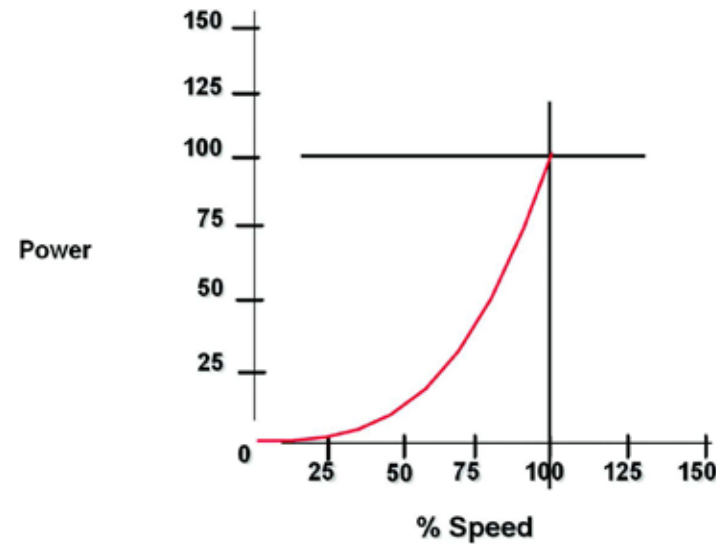
Controlling Pumps with VFDs

A More Efficient Way To Throttle Chilled/ Hot Water

If you are using valves to throttle water flow, your pumps are running at 100% force all of the time. You are wasting energy and creating unnecessary wear and tear on your system.

A more efficient way to control flow is by modulating motor speed with a VFD. In addition to controlling frequency, VFDs control voltage. By controlling both simultaneously, VFDs can speed up or slow down pumps and regulate the water pressure. With slow starts and steadily regulated pressure, VFDs offer as much as 87.5% savings when run at 1/2 motor speed.

The benefits of VFDs are now widely recognized. Many states now require them on all motors over 25 HP. Power companies typically offer rebates for new installation of VFDs on circulation pumps and other applications. Call Industrial Controls today for an analysis of how VFDs can save you energy.



Energy Savings

3/4 motor speed = 42% power
1/2 motor speed = 12.5% power

Benefits of VFDs:

- Saves energy
- Extends motor life
- More accurate control
- Makes the process controllable
- Decreases the load on the electrical network due to direct starts of motors

Controlling Pumps with VFDs

Case Study: Campus Circulation Pump

A manager at an engineering college in Wellesley Massachusetts was assigned the task of implementing energy savings initiatives throughout the campus. He contacted Rawson/Industrial Controls for assistance optimizing his boiler room. Rawson/Industrial Controls surveyed the boiler room and found two recirculation pumps running continuously during the winter months with their balancing valves choked down over 50%.

Rawson/Industrial Controls recommended energy rebates from the campus's power supplier and suggested the appropriate VFD to meet the criteria of the program. Rawson/Industrial Controls was able to project energy savings using a savings calculator. Armed with a full plan for energy savings and financing, the college installed the new VFD's, opened the balancing valves all the way and adjusted the motor speed down to 35HZ (just about half the speed at which they running before). Between the energy rebate and the slowing of the motors, **payback was in months, not years.**

Energy Savings Analysis Report

Equipment Ref: Recirculation Pump #2
Motor HP: 7.5 HP
Cost kWh: \$0.11

Operation Per Day (Variable Flow)

50% Flow 12 hours

0% Flow 12 hours

Total hours of operation: 4,380

Present Operation

100% Flow 12 hours

Annual Cost Constant Flow: \$2,696

Annual Cost with VFD: \$539

Energy Savings: \$2,157

Energy Savings %: 80%

Utility Rebate: \$1,500

Engineered Solutions



- In-house control-systems engineers who are available to help specify, design, and implement your control projects.

Learn more at:

www.rawsonicd.com/services-support/engineered-solutions

Variable Speed Drives



- VT Ratings: 3 - 100 HP, 208 VAC
3 - 250 HP, 480 VAC
- Overload capacity: 110% for 60 seconds (150% Peak)
- Designed for building automation applications such as fans, pumps, and cooling towers through 250 HP.

SmartVFD HVAC



- Start-up wizards
- PC software wizards
- Built-in communications
- Real-time clock
- Plenum rated for install flexibility
- Standard 3-year warranty

Three-Piece Booster Pumps



- Bearings, shaft and seal all housed in an assembly which can be easily repaired or replaced
- UL and CSA listings

Liquid Flow Paddle Switches



- 1" NPT
- Sensitivity adjusting screw makes flow adjustment easy
- Single pole, double throw snap switch

Relays



- Packaged to save the installer the time
- 10 or 15 Amps.
- Externally visible LED

Steam Trap Maintenance

Are Steam Trap Failures Costing You Thousands?

Steam traps are designed to prevent the loss of the BTU power in heat distribution lines. With a 5% annual failure rate, they must be checked on a regular basis. A malfunctioning steam trap will allow steam to escape into the condensate system or drain line. If you have not maintained your steam traps for 3-4 years, you probably have a 20% chance that you are losing thousands in energy loss and not even know it.

Two of the most common causes of trap failure are oversizing and dirt. Oversizing causes traps to work too hard. Dirt build-up, which is normal, can cause plugging or prevent a valve from closing. Here are some general indications of steam trap failure:

- abnormally warm boiler room
- condensate received venting steam
- condensate pump water seal failing prematurely
- overheating or underheating in conditioned space
- boiler operating pressure difficult to maintain



- vacuum in return lines difficult to maintain
- water hammer in steam and condensate lines
- steam in condensate return lines
- higher than normal energy bill
- inlet and outlet lines to trap nearly the same temperature

If you have reason to suspect that your steam trap valve downstream, by using sound equipment to listen to the action of the trap, or by measuring the temperature differential on the inlet and outlet of the trap.

Recommended Steam Trap Testing Intervals:

- High-Pressure (150 psig and above): Weekly to Monthly
- Medium-Pressure (30 to 150 psig): Monthly to Quarterly
- Low-Pressure (below 30 psig): Annually

Steam Trap Maintenance

Case Study: Configured Heat Exchanger System For Process Cleaning

A process engineering firm was hired to design and install a clean-in-place (CIP) system at a manufacturing plant. CIP is a method of cleaning the interior surfaces of pipes, vessels, process equipment, filters and associated fittings, without disassembly. It involves heating fluids for the cleaning process.

The application called for increasing 55 degree cleaning fluid to 200 degrees. The firm planned to supply a prefabricated skid with a heat exchanger for the end user.

The design firm, which had a 20 year history working with Rawson/Industrial Controls, sought help supplying a heat exchanger complete with control valves, heat/pressure/flow measurement, and steam traps for condensate recovery. Rawson/Industrial Controls took the firm's design and recommended the controls that would maximize the efficiency of the system. They supplied the controls, training and support required to meet the end-user's needs.



Clean In Place (CIP) Report



Our Service Capabilities



- System Design
- Panel Design
- Panel Drawings
- Panel Fabrication
- Wireless Surveys

Learn more at:

www.rawsonicd.com/services-support/engineered-solutions

Steam Solutions



- Mechanical Free Float®, Thermodynamic, and thermostatic steam traps
- Steam and condensate manifolds with integral sealed valves
- Ball, Gate, Globe and Check valves

Globe Valves



- Light, medium and heavy duty valves: single-seated, three-way mixing, and cage valves

Surveys



- Steam Trap Surveys: Energy Management & Technology (EM&T) division
- All EM&T members are TLV TrapMan® factory-trained and certified and have 10+ years of steam-trap testing experience in a variety of applications.
- Boiler & Burner Surveys

Learn more at:

<https://www.rawsonicd.com/services-support/surveys/>

Pressure Independent Control Valves



- 1/2" to 3/4"
- Vent holes reduce condensation build-up
- Actuator can be mounted in four different positions

Water Pressure Relief Valves



- Pressure range 30 to 150psi
- Sizes 3/4" - 2" (20 - 50mm)
- Non-mechanical seat-to-disc alignment will not stick or freeze.

Why Meter Gas, Steam and Electric?

You can't reduce energy usage without knowing where these valuable resources are being used. Many facility managers are starting to allocate costs to the end users of gas, steam, and electricity in their plant and buildings. Holding consumers of energy accountable for energy usage motivates them to conserve.

Flow meters for gas, steam and electric usage transmitters can send data to central networks that can monitor, trend, and archive rates and totals, and email individual departments or tenants their monthly usage.

Many states are mandating that yearly fuel flows be reported for gas and oil usage for each device that is capable of generating five million BTU's per hour or more. Five million BTUs is equivalent to a 150 HP boiler.



Electric submeters help facility managers track everything from common area usage and HVAC system performance to monitoring after-hours energy usage. Submeters provide detailed and accurate interval data snapshots of energy use.

Users are billed high kilowatt demand rates for an entire month or multiple months even if the demand only occurs for a 15-30 minute period during a given month. The key to avoiding these exorbitant costs is to identify peaks in usage and proactively take steps to reduce those peaks. Graphic profiling of individual or aggregated loads will pinpoint peak usage areas or equipment. With this data, facility managers are able to employ load controlling devices to set high/low thresholds, control loads and reduce energy costs.

Case Study: Morristown, NJ Boilers

Rawson/Industrial Controls installed gas meters on (17) boilers in (5) different buildings a complex in Northern New Jersey. The NJDEP, as of 2010, requires that users of boilers and water heaters that are capable of generating five million BTUs or more per hour, submit the total gas usage for each device to the state along with a yearly combustion efficiency test.

The customer selected a gas meter that compensates for temperature and pressure changes of the natural gas, and has no moving parts.

The real challenge was logging total gas usage. Even though the meter shows a "running" total on each meter display, **the customer required that all (17) meters be totalled in a spreadsheet every month.** This was further complicated by the fact the each location required a key for entry to the boiler room.



Rawson/Industrial Controls suggested that the customer use a paperless recorder to archive and email these totals each month to the plant personnel. The meters were wired to their respective paperless recorders, and at the end of each month, each paperless recorder emails a report with tag name and monthly total for each meter to plant personnel using the customers existing network. This could also be accomplished using wireless technology if a plant network was not available.

Vortex Flow Meters

azbil



- Includes a function for correcting temperature and pressure to provide high-accuracy measurements for wide-ranging applications such as for gas, liquid, and steam

Electrical Submetering

Honeywell



- E-Mon Class 6200 Submeter
- One meter to meet all applications needs
- Split-core CTs
- Bluetooth capable

Gas Flow Meters

Norgas NMT



- Positive displacement type gas meter
- Measurement accuracy is not affected by changes in specific gravity, changing pressures or fluctuating flows
- Compact size, ease of maintenance & robust performance

Precision Turbine Flow Meters

GPI



- Optional low drag pickup
- 316 stainless steel housing
- +/- 0.5% accuracy
- +/- 0.1 repeatability

Gas Detection

Honeywell



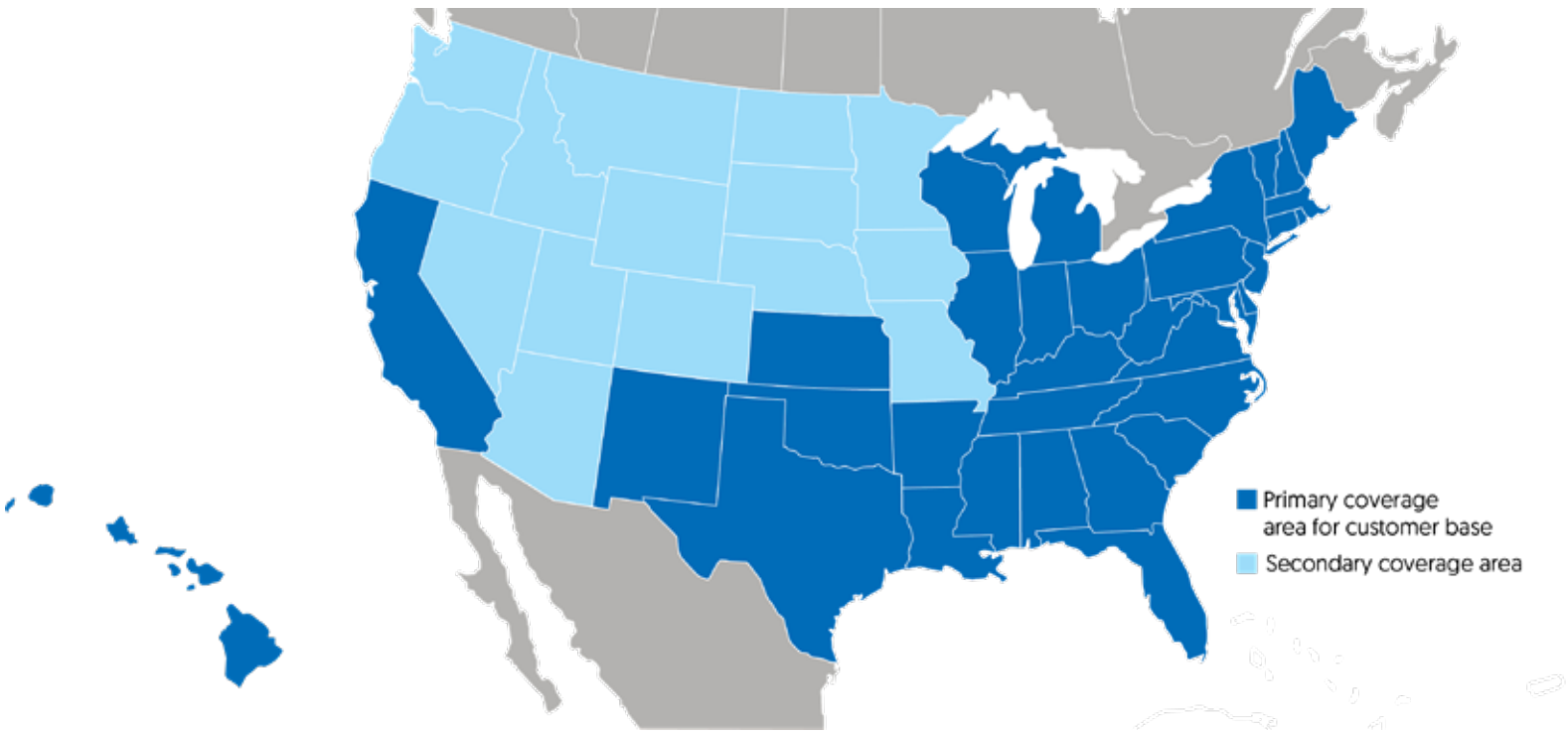
- Gas sensor junction box featuring simplified maintenance using familiar smartphone technology
- Easy access to hard-to-reach detectors
- Bright "traffic light" indicator for safety awareness

Magmeters

ABB



- Extensive line of both DC and AC magnetic flow meters
- Magnetic flow meters are available in both wafer and flanged styles
- Flanged units start at .04" line sizes up to 96" line size



Contact Information

Inquiries and Quotations:
rawsonicd.com/quote-request

General Questions and Inquiries:
rawsonicd.com/contact-us

rawsonicd.com

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